

REMARKS

The Office Action mailed November 22, 2002, has been carefully considered together with each of the references cited therein. The amendments and remarks presented herein are believed to be fully responsive to the Office Action. The amendments made herein are fully supported by the Application as originally filed. No new matter has been introduced. Accordingly, reconsideration of the present Application in view of the above amendments and following remarks is respectfully requested.

CLAIM STATUS

Claims 1-21 are pending in this Application. Claims 12 and 13 are withdrawn from consideration as being directed to a non-elected species. By this Amendment, Applicants have amended claims 1, 5, 14, 15, 18, 19 and 21. Applicants have added new claim 22 to more particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claims 2 and 3 have been cancelled. Therefore, it is believed that the claims under consideration includes claims 1, 4-11, and 14-22.

In paragraph 1 of the Office Action, the Examiner makes reference to the fact that claim 1 replaced the cation NH_4^+ with -- H_4^+ -- without properly indicating that the cation " NH_4^+ " was to be deleted and the term -- H_4^+ was to be added. This was a typographical error on Applicants part which has been corrected by this Amendment. Specifically, H_4^+ has been deleted from the claims.

In paragraph 2 of the Office Action, the Office notes that in the previous amendment, Applicants excluded structured silicates comprising cations of alkali metals. The Office then draws the following conclusion:

[I]nstant claims 1, 14, 15, and 21 exclude "salt-like" structured silicates or salts of ionic structured silicates comprising any amount of alkali metal. In other words, no alkali metal cations can be present in these "salt-like structured" silicates or salts of ionic structured silicates recited as being part of applicants' invention.

Applicants respectfully can not agree with this conclusion. It is chemically impossible to make silicates completely free of alkali metals. At least traces are always present. The invention, in one aspect, lies in the presence of low molecular weight organic cations, other cations may be present as well.

In paragraph 3 the Office Action, the Office states that "Applicants' elected salt, distearyldimethyl ammonium bentonite, appears to be outside the scope of instant claims 1, 14, 15 and 21, because bentonite is identified as sodium montorillonite. . . There is no evidence on the present record to show that the elected salt, quaternary ammonium bentonite, contains no sodium ions as required by the instant claims." Applicants respectfully do not agree.

While Applicant agrees that bentonite contains sodium, in distearyldimethyl ammonium bentonite, most of the sodium cations are replaced by distearyldimethyl ammonium cations. For this reason, it is believed that the ultimate elected species remains within the scope of the claims, as amended by this Amendment.

Objections to the Disclosure

The Office objects to the specification on page 13, lines 11 and 12 for the use of phrase " $-\text{SO}_3^{\text{O}}$ ". The specification has been amended to replace the above referenced moiety with " $-\text{SO}_3^-$ ".

The Office makes reference to the fact that there exists instances within the specification wherein the recited trademarks have not been capitalized. Applicants have amended the specification in all areas wherein trademarks appear to be in conformance with US practice.

Based upon the foregoing, it is respectfully contended that the objections to the specification have been overcome.

Claim Rejection Under 35 USC § 112, Second Paragraph

Claims 1-11 and 16-18 stand rejected under 35 USC § 112, second paragraph, as being indefinite.

Claims 1 and 18 are viewed as indefinite by the Office for the phrase " salt-like structured silicates". Claim 1 have been amended to recite "structured silicate salt."

Claims 1 and 18 are found indefinite by the Office for use of the phrase "a method of imparting . . . the charge in an electrostatic separation of a polymer process ..." In addition, the term "electrostatic separation of a polymer process" is viewed as indefinite by the Office. By this Amendment, all reference to the "electrostatic separation of a polymer" has been deleted from the claims.

The Office finds the term " H_4^+ " indefinite because it is not clear how four hydrogen atoms are bonded to one another to form cation. The claims have been amended to delete the term " H_4^+ ".

The Office is of the position that claim 18 is indefinite in the phrase "adding a salt-like structured silicate . . . to an electrostatic separation of a polymer process to form a mixture". As noted above, all reference to the "electrostatic separation of a polymer" has been deleted from the claims.

The Office finds claim 2 indefinite for use of the phrase "anion is selected from the group consisting of montmorillonite . . ." Claim 2 is further indefinite because the compounds listed in the Office Action are said by the Office to be outside the scope of the instant claim 1. This rejection is now moot as claim 2 has been cancelled.

Claim 3 has been found indefinite because the cations referenced in the Office Action are believed by the Office to be outside the scope of instant claim 1. Claim 3 has been cancelled.

Claim 5 is found indefinite by the Office in that the moiety " $-SO_3^{\sigma}$ " is indefinite because the subscript " σ " is not defined. Claim 5 is has been amended to recite " SO_3^- ".

Claim 21 is found indefinite as the Office is of the position that it recites improper Markush language. Claim 21 has been amended to recite proper Markush language.

In view of the foregoing, it is respectfully believed that the 35 USC § 112, second paragraph, rejections have been overcome.

Claim Rejection Under 35 USC § 101

Claims 1-11 and 16-18 stand rejected under 35 USC § 101. The Office is of the position that "the claimed recitation of a "use" without setting forth any steps involved in the process results in an improper definition of a process." This rejection is respectfully traversed.

Independent claim 1 and 18 both recite a method of imparting, controlling or improving the charge of an electrophotographic toner or developer, a powder coating or an electret material which comprises the step of adding a structured silicate salt . . . The positive recitation of the term "adding" is seen by Applicants to constitute a proper affirmative step, thereby placing the claims squarely within the form mandated by 35 USC § 101. Applicants therefore respectfully request withdrawal of this rejection.

Rejections Under 35 USC § 112, First Paragraph

Claims 1-11, 16-19, and 21 stand rejected under 35 USC § 112, first paragraph. Specifically the Office makes reference to the cation " H_4^+ ". As discussed above, all instances of the cation " H_4^+ " have been deleted from the claims.

The Office finds claims 1 and 18 recite an electrostatic separation of a polymer process and the Office is of the opinion that the specification does not provide an adequate description of this process. As previously mentioned, all reference to the "electrostatic separation of a polymer" has been deleted from the claims.

With respect to claim 19, the Office is of the position that the specification does not provide adequate description for the phrase "electrophotographic toner or developer comprising distearyldimethyl ammonium and bentonite." The Office states that "the originally filed specification at pages 30-31 disclose the "salt-like"

structured silicate "distearyl dimethyl ammonium bentonite". Claim 19 has been amended to delete the word "and" between ammonium and bentonite.

The Office takes the position that claim 21 does not have adequate written description within the specification. By this Amendment, claim 21 has been amended to limit the claim to an electrophotographic toner.

In view of the above amendments and remarks, it is respectfully submitted that the 35 USC § 112, first paragraph, rejection has been overcome.

Claim Objections

Claim 1 is objected to for the lack of comma between the terms "developer" and "electret material." The comma has been added to claim 1.

Claim 5 is stated to have extraneous comma in the phrase "phenyl, naphthyl, or heteroaryl,;". Claim 5 has been amended to delete the extraneous comma.

Claims 14 and 21 are stated by the Office as missing the conjugation "and" between the terms "binder" and "0.01" in the phrase "of a binder, 0.01 to 50% by weight, of at least one salt . . ." The word "and" has been inserted in claims 14 and 21 where appropriate.

The Office states that claim 15 is missing the conjugation "and" between the terms "binder" and "0.05" in the phrase "of a binder, 0.05 to 20% by weight, of at least one salt . . ." Claim 15 has been amended to introduce the word "and" where appropriate.

In view of the foregoing, it is respectfully believed that the claim objections have been overcome.

Claim Rejections Under 35 USC § 102

Claims 1-11, 16-18, and 21 stand rejected under 35 USC § 102(b) as being anticipated by US 4,808,849 (Inculet). Claim 18 stands rejected under 35 USC § 102(b) as being anticipated by US 4,404,270 (Higashida). Claims 1-11, 14-18, 20, and 21 stand rejected under 35 USC § 102(b) as being anticipated by Japanese Patent 55-166652 (JP '652), as evidenced by Japanese Patent Office English-abstract of JP'652, American Chemical Society (ACS) file registry no. 1332-58-7,

and Grant and Hackh's Chemical Dictionary, fifth edition, page 321. These rejections are respectfully traversed.

All of Applicant's independent claims, as amended, recite the cation of the structured silicate salt as being a low molecular weight organic cation. Inculet ('849, Higashida ('270) and JP '652 do not teach, disclose, or suggest a structured silicate salts containing low molecular weight organic cations.

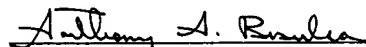
As it is beyond contention that a rejection under § 102(b) requires the reference to teach each and every element of Applicants' invention, as claimed, it is respectfully submitted that the rejections under § 102(b) are inappropriate, as none of the cited references teach a low molecular weight organic cation. Therefore, Applicants respectfully request reconsideration and withdrawal of the § 102(b) rejections.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current Amendment. The attached document is entitled "**Version with Markings to Show Changes Made.**"

The Commissioner is hereby authorized to charge deposit account 03-2060 \$18.00 for the additional claim. The Commissioner is also authorized to credit any overpayment or charge any fee deficiency to Deposit Account No. 03-2060.

In view of the forgoing amendments and remarks, the present application is believed to be in condition for allowance, and reconsideration of it is requested. If the Examiner disagrees, she is requested to contact the attorney for Applicants at the telephone number provided below.

Respectfully submitted,



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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Michel et al.

Docket: 1999DE132

Serial No.: 09/722,760

Group Art Unit: 1753

Filed: 11/27/2000

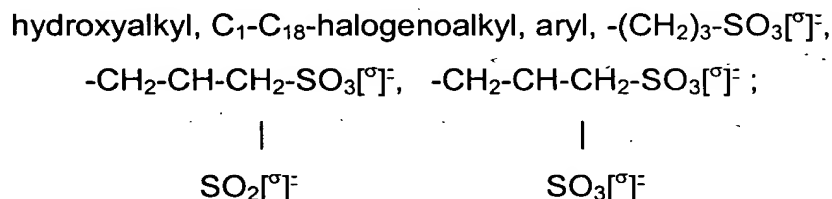
Examiner: Dote, Janis L.

For: Use of Salt-Like Structured Silicas as Control Agents

Version with Markings to Show Changes Made

IN THE SPECIFICATION

Please amend the text on page 13, lines 11 through 15 as follows:



On page 27, please amend the paragraph beginning on line 17 as follows:

Alkylated arylsulfonates, such as barium petronates, calcium petronates, barium dinonylnaphthalene sulfonates (basic and neutral), calcium dinonylsulfonate or dodecylbenzene sulfonic acid Na salt, and polyisobutylenesuccinimides (Chevrons [Oloa] OLOA® 1200) are particularly suitable.

On page 28, please amend the paragraph beginning on line 4 as follows:

The structured silicates used according to the invention are incorporated homogeneously, for example by extrusion or kneading, bead grinding or with an [Ultraturrax] ULTRATURRAX® (high-speed stirrer) into the binder of the particular toner, developer, coating, powder coating, electret material or polymer to be separated electrostatically individually or in combination with one another or with

further above mentioned charge control agents in a concentration of 0.01 to 50% by weight, preferably 0.05 to 20% by weight, particularly preferably 0.1 to 5.0% by weight, based on the total mixture. The compounds employed according to the invention can be added here as dried and ground powders, dispersions or solutions, presscakes, masterbatches, preparations, mixed pastes, as compounds absorbed from aqueous or non-aqueous solution onto suitable carriers, such as, for example, silica gel, or mixed with such carriers, TiO_2 , Al_2O_3 or carbon black, or in another form. The compounds used according to the invention can in principle also be added as early as during the preparation of the particular binders, that is to say in the course of polymerization, polyaddition or polycondensation thereof.

Please amend the paragraph beginning on line 26 of page 28 and ending on line 9 of page 29 as follows:

Preferred blue and/or green pigments are copper phthalocyanines, such as C.I. Pigment Blue 15, 15:1, 15:2, 15:3, 15:4, 15:6, P. Blue 16 (metal-free phthalocyanine), or phthalocyanines with aluminum, nickel, iron or vanadium as the central atom, and furthermore triarylcarbonium pigments, such as Pigment Blue 1, 2, 9, 10, 14, 62, 68, Pigment Green 1, 4, 7, 45; orange pigments, such as, for example, P.O. 5, 62, 36, 34, 13, 43, 71; yellow pigments, such as, for example, P.Y. 12, 13, 17, 83, 93, 122, 155, 180, 174, 185, 97; red pigments, such as, for example, P.R. 48, 57, 122, 146, 149, 184, 186, 202, 207, 209, 254, 255, 269, 270, 272; violet pigments, such as P.V. 1, 19, carbon black, iron/manganese oxides; and furthermore mixed crystals of C.I. Pigment Violet 19 and C.I. Pigment Red 122. The mixtures can be prepared in the form of the powders, by mixing presscakes, spray-dried presscakes, masterbatches and by dispersing (extrusion, kneading, roll mill processes, bead mills, [Ultraturrax] ULTRATURRAX®) in the

presence of a carrier material in solid or liquid form (in water-based and non-aqueous inks) and by flushing in the presence of a carrier material.

Please amend the paragraph beginning on line 30 of page 29 and ending on line 3 of page 30 as follows:

Inorganic pigments, such as, for example TiO_2 or BaSO_4 , are used in mixtures for brightening. Mixtures with effect pigments, such as, for example, pearlescent pigments, Fe_2O_3 pigments ([®Paliochrome] PALIOCHROME®) and pigments based on cholesteric polymers, which produce different color impressions depending on the angle of observation, are furthermore suitable.

Please amend the paragraph beginning on line 15 of page 31 as follows:

10 g of a magnesium hydrosilicate ([Optigel] OPTIGEL® SH, "Hectorite") are dispersed in 400 ml of deionized water at room temperature for 2 hours.

In the table on page 37, please replace the phrase "Optigel WM" with the phrase --OPTIGEL® WM--.

Please amend the paragraph beginning on line 1 of page 40 as follows:

The procedure is as in Use Examples 1, 38 and 39, 5 parts of an organic pigment (carbon black [®Mogul] MOGUL® L, Cabot; [®]Toner Magenta EO2, Clariant (C.I. P. Red 122); [®]Toner Yellow HG, Clariant (C.I. P. Yellow 180)) additionally also being incorporated.

Please amend the paragraph beginning on line 6 of page 41 as follows:

1 part of the compound from Use Example 1 was incorporated homogeneously into 99 parts of a powder coating binder

([[®]Crylcoat]CRYLCOAT[®] 430), as described in the Use Examples mentioned above. Tribo-spraying of the powder (coatings) was carried out with a [[®]TriboStar] TRIBOSTAR[®] spray apparatus from Intec (Dortmund) with a standard spray tube and a star inner rod at maximum powder throughput with a spray pressure of 3 and 5 bar. The current intensity resulting from the electrostatic charging of the powder coating or powder was indicated in μA . The deposition rate was then determined in % by the difference in weight of the powder coating sprayed and that deposited.

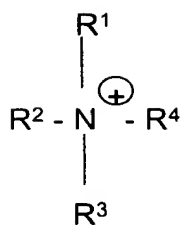
IN THE CLAIMS

Please cancel claims 2, and 3.

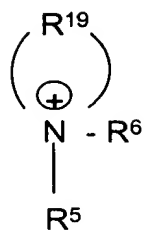
Please amend claims 1, 5, 14, 15, 18, 19 and 21.

1. (Twice Amended) A method of imparting, controlling or improving the charge of an electrophotographic toner or developer, or an electret material [or in an electrostatic separation of a polymer process], comprising the step of adding a [salt-like] structured silicate salt in which the cation is [H_4^+ , H_3O^+ , alkaline earth metal, earth metal or transition metal ion or] a low molecular weight organic cation [or a combination thereof] and the anion is an island, cyclic, group, chain, ribbon, laminar or matrix silicate or a combination thereof to a binder of an electrophotographic toner or developer or of an electret material[or to an electrostatic separation of a polymer process].

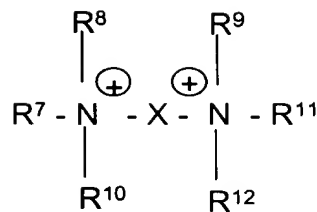
5) (Twice Amended) The method as claimed in claim 4, wherein the ammonium ion has one of the formulae (a) - (j)



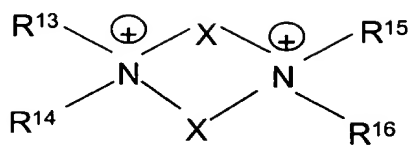
(a)



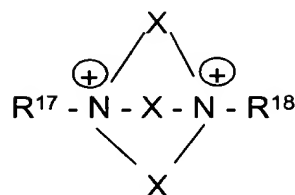
(b)



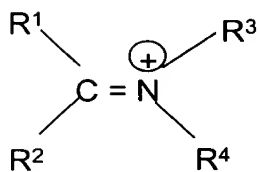
(c)



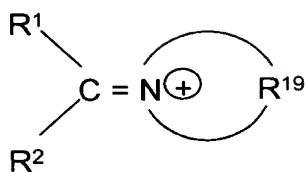
(d)



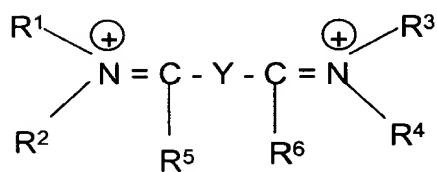
(e)



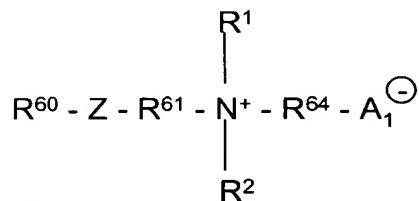
(f)



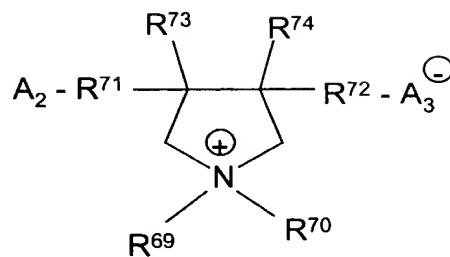
(g)



(h)



(i)

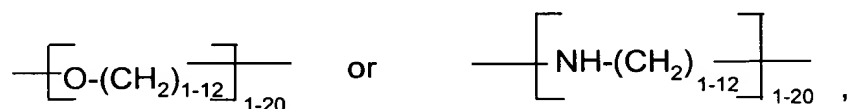


(j)

in which

R^1 to R^{18} are identical or different and represent hydrogen, CN, $(CH_2)_{1-18}CN$, halogen, branched or unbranched C_1 - C_{32} -alkyl, mono- or polyunsaturated C_2 - C_{32} -alkenyl, C_1 - C_{22} -alkoxy, C_1 - C_{22} -hydroxyalkyl, C_1 - C_{22} -halogenoalkyl, C_2 - C_{22} -halogenoalkenyl, C_1 - C_{22} -aminoalkyl, $(C_1$ - $C_{12})$ -trialkyl-ammonium- $(C_1$ - $C_{22})$ -alkyl; $(C_1$ - $C_{22})$ -alkylene- $(C=O)O$ - $(C_1$ - $C_{32})$ alkyl, $(C_1$ - $C_{22})$ -alkylene- $(C=O)O$ -aryl, $(C_1$ - $C_{22})$ -alkylene- $(C=O)NH$ - $(C_1$ - $C_{32})$ alkyl, $(C_1$ - $C_{22})$ -alkylene- $(C=O)NH$ -aryl, $(C_1$ - $C_{22})$ -alkylene- $O(CO)$ - $(C_1$ - $C_{32})$ alkyl, $(C_1$ - $C_{22})$ -alkylene- $O(CO)$ aryl, $(C_1$ - $C_{22})$ -alkylene- $NH(C=O)$ - $(C_1$ - $C_{32})$ alkyl, $(C_1$ - $C_{22})$ -alkylene- $NHCO$ -aryl,

wherein

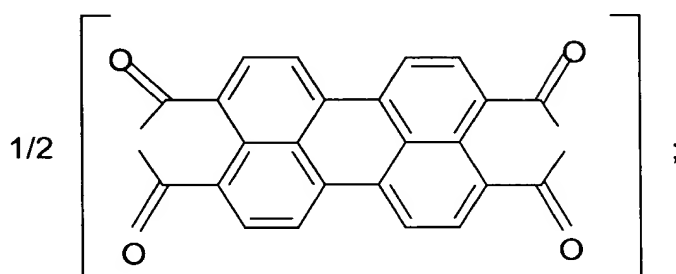
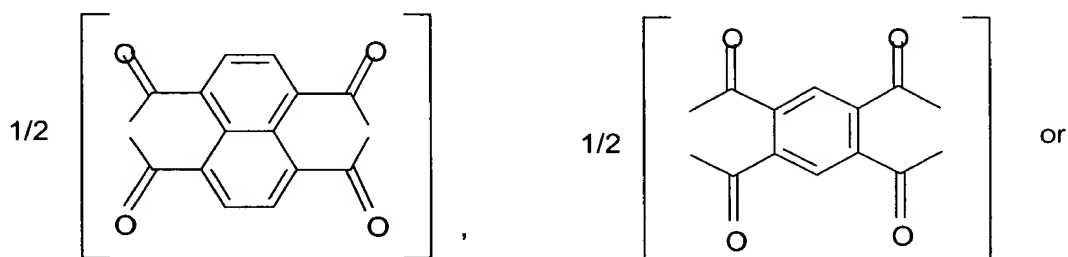
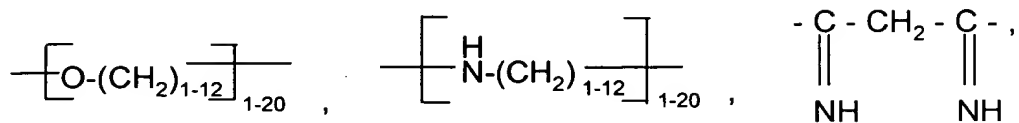


are optionally inserted into the acid ester or acid amide bonds;

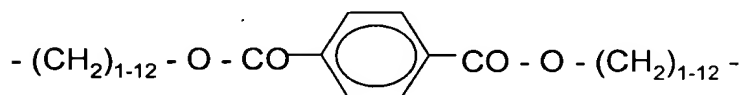
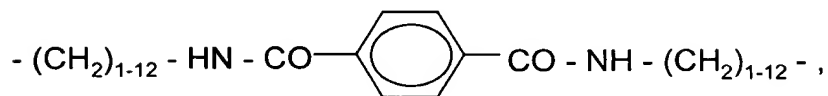
$[(C_1$ - $C_{12})$ -alkylene- O -] $_{1-100}$ -H; aryl, $(C_1$ - $C_{18})$ -alkylenearyl; $-(O-SiR'_2)_{1-32}-O-SiR'_3$, in which R' has the meaning C_1 - C_{12} -alkyl, phenyl, benzyl or C_1 - C_{12} -alkoxy; heterocyclyl, C_1 - C_{18} -alkylene-heterocyclyl, wherein the aryl and heterocyclyl radicals are optionally mono- or polysubstituted on carbon atoms or heteroatoms by C_1 - C_{12} -alkyl, C_1 - C_4 -alkenyl, C_1 - C_4 -alkoxy, hydroxy- $(C_1$ - $C_4)$ alkyl, amino- $(C_1$ - $C_4)$ alkyl, C_1 - C_4 -alkylimino, carboxyl, hydroxyl, amino, nitro, cyano, halogen, C_1 - C_{12} -acyl, C_1 - C_4 -halogenoalkyl, C_1 - C_4 -alkylcarbonyl, C_1 - C_4 -alkylcarbonyloxy, C_1 - C_4 -alkoxycarbonyl, C_1 - C_4 -alkylaminocarbonyl, C_1 - C_4 -alkylcarbonylimino, C_6 - C_{10} -arylcarbonyl, aminocarbonyl, aminosulfonyl, C_1 - C_4 -alkylaminosulfonyl, phenyl, naphthyl, or heteroaryl[.];

R^{19} represents C_4 - C_{11} -alkylene, $-(C_2H_4-O-)_{1-17}-(CH_2)_{1-2}$, $-(C_2H_4-NR-)_{1-17}-(CH_2)_{1-2}$, in which R is hydrogen or C_1 - C_{12} -alkyl;

X has the meaning of Y or $-CO-CH_2-CO-$,



Y has the meaning $\begin{array}{c} -\text{C}- \\ \parallel \\ \text{O} \end{array}$, $\begin{array}{c} -\text{C}- \\ \parallel \\ \text{S} \end{array}$, $\begin{array}{c} -\text{C}- \\ \parallel \\ \text{NH} \end{array}$, $-(\text{CH}_2)_{1-18}-$,



or o-, p-, m-(C₆-C₁₄)-arylene or (C₄-C₁₄)-heteroarylene with 1, 2, 3 or 4 heteroatoms selected from the group consisting of N, O, S and a combination thereof;

R⁶⁰ represents C₁-C₃₂-acyl, C₁-C₂₂-alkyl, C₂-C₂₂-alkenyl, C₁-C₁₈-alkylene-C₆-C₁₀-aryl, C₁-C₂₂-alkylene-heterocyclyl, C₆-C₁₀-aryl or (C₄-C₁₄)-heteroaryl with 1, 2, 3 or 4 heteroatoms selected from the group consisting of N, O, S, and a combination thereof;

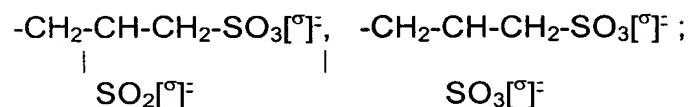
R⁶¹ and R⁶⁴ represent -(CH₂)₁₋₁₈-, C₁-C₁₂-alkylene-C₆-C₁₀-arylene, C₆-C₁₀-arylene, C₀-C₁₂-alkylene-heterocyclyl;

Z represents -NH- or -O- ;

A₁⁻ and A₃⁻ represent -COO⁻, -SO₃⁻, -OSO₃⁻, -SO₂⁻, -COS⁻ or -CS₂⁻;

A₂ represents -SO₂Na, -SO₃Na, -SO₂H, -SO₃H or hydrogen;

R⁶⁹ and R⁷⁰ independently of one another represent hydrogen, C₁-C₃₂-alkyl, in which the alkyl chain optionally contain one or more of the groups -NH-CO-, -CO-NH-, -CO-O- or -O-CO-; C₁-C₁₈-alkylene-aryl, C₀-C₁₈-alkylene-heterocyclyl, C₁-C₁₈-hydroxyalkyl, C₁-C₁₈-halogenoalkyl, aryl, -(CH₂)₃-SO₃[^σ]⁻,



R⁷¹ and R⁷² represent -(CH₂)₁₋₁₂-; and

R⁷³ and R⁷⁴ represent hydrogen or C₁-C₂₂-alkyl.

14) (Twice Amended) An electrophotographic toner comprising 30 to 99.99% by weight of a binder, and 0.01 to 50% by weight, of at least one salt of ionic structured silicates in which the cation is [NH₄⁺, H₃O⁺, alkaline earth metal, earth metal or transition metal ion or] a low molecular weight organic cation [or a combination thereof] and the anion is an island, cyclic, group, chain, ribbon, laminar or matrix

silicate or a combination thereof, based on the total weight of the electrophotographic toner.

15) (Twice Amended) An electrophotographic toner as claimed in claim 14, comprising 40 to 99.5% by weight of a binder, and 0.05 to 20% by weight of at least one salt of ionic structured silicates in which the cation is $[\text{NH}_4^+, \text{H}_3\text{O}^+, \text{alkaline earth metal, earth metal or transition metal ion or}]$ a low molecular weight organic cation [or a combination thereof] and the anion is an island, cyclic, group, chain, ribbon, laminar or matrix silicate or a combination thereof, based on the total weight of the electrophotographic toner.

18. (Amended) A method of imparting, controlling or improving the charge of an electrophotographic toner or developer, of a powder coating, of an electret material [or in an electrostatic separation of a polymer process], comprising the steps of adding a [salt-like] salt structured silicate in which the cation is $\text{NH}_4^+, \text{H}_3\text{O}^+, \text{an alkali metal, alkaline earth metal, earth metal or transition metal ion or}$ a low molecular weight organic cation or a combination thereof and the anion is an island, cyclic, group, chain, ribbon, laminar or matrix silicate or a combination thereof to a binder of an electrophotographic toner or developer or of a powder coating, or to an electret material [or to an electrostatic separation of a polymer process to form a mixture, and electrostatically charging the mixture].

19. (Amended) An electrophotographic toner or developer comprising distearyldimethyl ammonium [and] bentonite.

21. (Amended) A composition comprising 30 to 99.99% by weight of a binder, and 0.01 to 50% by weight, of at least one salt of ionic structured silicates in which the cation is $[\text{NH}_4^+, \text{H}_3\text{O}^+, \text{alkaline earth metal, earth metal or transition metal ion or}]$ a low molecular weight organic cation [or a combination thereof] and the anion is an island, cyclic, group, chain, ribbon, laminar or matrix silicate or a combination

thereof, based on the total weight of the composition, wherein the composition is [selected from the group consisting of] an electrophotographic [developer] toner[, an electret material or an electrostatically separated polymer].

Please add new claim 22:

22. (New) A method of imparting, controlling or improving the charge of an electrophotographic toner or developer, or an electret material comprising the step of adding a distearyldimethyl ammonium bentonite to a binder of an electrophotographic toner or developer or of a powder coating or of an electret material.